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Job No.: CTCE/BBMP/W.No.13/KRIDL/SDBC/Shape_T/2015-16 : 01.02.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Improvements and Asphalting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
Reference	: EE/DD/WO/447/2013-14 Dated: 08.03.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 01.02.2016

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **11.85%**

Elongation Index = **13.98%**

Result : Combined Flakiness & Elongation index **25.83%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

Note:

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
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Reference	: EE/DD/WO/447/2013-14 Dated: 08.03.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 01.02.2016

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.34%**

Elongation Index = **13.05%**

Result : Combined Flakiness & Elongation index **25.39%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.13/KRIDL/SDBC/Stripping/2015-16 04.02.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	Improvements and Asphalting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP,
Reference	EE/DD/WO/447/2013-14 Dated: 08.03.2013
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	04.02.2016

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.2	3.30	96.70
2	3.3		
3	3.4		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.13/KRIDL/SDBC/SDBC/Sp_Wa/2015-16 04.02.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements and Asphalting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
Reference	EE/DD/WO/447/2013-14 Dated: 08.03.2013
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	04.02.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2024	2025	2026	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1269	1270	1271	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2017	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	747	747	747	
6	Weight of oven dried aggregate	W_4 g	2000	2003	2001	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.677	2.681	2.679	2.679
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.736	2.733	2.741	2.737
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.70%	0.85%	0.78%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.13/KRIDL/SDBC/Bit/2015-16 04.02.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements and Asphalting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
REFERENCE	EE/DD/WO/447/2013-14 Dated: 08.03.2013
SAMPLE I/D	Roads in Mallasandra Ward No.13.
DATE OF TESTING	04.02.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	25.50
7. Bitumen content in %	5.00	5.10
8. Average	**5.05**	

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BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements and Asphalting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
REFERENCE	EE/DD/WO/447/2013-14 Dated: 08.03.2013
SAMPLE I/D	Roads in Mallasandra Ward No.13.
DATE OF TESTING	04.02.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	24.35	5.13	5.13	94.87	90-100
4.75	260.5	54.84	59.97	40.03	35-51
2.36	51.36	10.81	70.78	29.22	24-39
1.18	35.24	7.42	78.20	21.80	15-30
0.3	36.36	7.65	85.85	14.15	9-19
0.075	35.65	7.51	93.36	6.64	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	38.59	8.13	8.13	91.87	90-100
4.75	262.5	55.32	63.45	36.55	35-51
2.36	56.34	11.87	75.33	24.67	24-39
1.18	33.32	7.02	82.35	17.65	15-30
0.3	30.22	6.37	88.72	11.28	9-19
0.075	28.56	6.02	94.74	5.26	3-8

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Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements and Asphalting to Mallasandra main road from Govt. School to Anjaneya Swamy temple road in Mallasandra, Ward No.13, SSD, BBMP, Bangalore.
Reference	EE/DD/WO/447/2013-14 Dated: 08.03.2013
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	04.02.2016

Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	385	7.3	7.26	92.74	90-100	
4.75	2650	50.0	57.26	42.74	35-51	
2.36	645	12.2	69.43	30.57	24-39	
1.18	480	9.1	78.49	21.51	15-30	
0.3	420	7.9	86.42	13.58	9-19	
0.075	380	7.2	93.58	6.42	3-8	

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	335	6.4	6.44	93.56	90-100	
4.75	2545	48.9	55.38	44.62	35-51	
2.36	835	16.1	71.44	28.56	24-39	
1.18	525	10.1	81.54	18.46	15-30	
0.3	380	7.3	88.85	11.15	9-19	
0.075	355	6.8	95.67	4.33	3-8	

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